

Claims

1. An implantable prosthesis for a tissue or muscle defect, the implantable prosthesis comprising:

a first layer of material that permits the formation of adhesions with tissue or muscle;

a second layer of material that permits the formation of adhesions with tissue or muscle, the second layer being attached to the first layer;

at least one pocket formed between the first and second layers; and

a layer of barrier material that is resistant to the formation of adhesions with tissue or muscle, the layer of barrier material being attached to at least the second layer only at discrete locations.

2. The prosthesis according to claim 1, wherein the at least one pocket is defined by attachment of the first and second layers.

3. The prosthesis according to claim 1, wherein the at least one pocket includes an access opening for gaining access to an interior of the at least one pocket.

4. The prosthesis according to claim 1, wherein substantial areas of the second layer are free from attachment to the layer of barrier material.

5. The prosthesis according to claim 1, wherein the second layer is attached to the layer of barrier material only at discrete locations.

6. The prosthesis according to claim 1, wherein the second layer is constructed and arranged to support stress induced by patient movement.

7. The prosthesis according to claim 1, wherein the prosthesis is constructed and arranged to be provisionally attached to tissue or muscle.

8. The prosthesis according to claim 1, wherein the first and second layers are connected by first stitches that do not extend through the layer of barrier material.

9. The prosthesis according to claim 8, wherein the first and second layers are connected to the layer of barrier material by second stitches.

5 10. The prosthesis according to claim 9, wherein at least the second stitches are formed from a tissue or muscle adhesion resistant material.

10 11. The prosthesis according to claim 1, further comprising a peripheral edge, an outer area disposed inwardly of the peripheral edge, an inner area disposed inwardly of the outer area, and a first reinforcing member substantially surrounding the outer area and being constructed and arranged to reinforce at least the outer area.

15 12. The prosthesis according to claim 11, further comprising a second reinforcing member inwardly spaced from the first reinforcing member between the inner and outer areas

13. The prosthesis according to claim 1, wherein each of the first and second layers includes a plurality of interstices that are constructed and arranged to allow tissue or muscle to grow into the first and second layers.

20 14. The prosthesis according to claim 1, further comprising a peripheral edge that is constructed and arranged to resist the formation of tissue or muscle adhesions thereto.

25 15. The prosthesis according to claim 1, wherein the layer of barrier material covers an entire surface of the second layer.

16. The prosthesis according to claim 1, wherein the layer of barrier material includes ePTFE.

30 17. The prosthesis according to claim 16, wherein the ePTFE has fibril lengths of less than 5 microns.

18. The prosthesis according to claim 17, wherein the ePTFE has fibril lengths of less than 1 micron.

19. The prosthesis according to claim 18, wherein the ePTFE has fibril lengths of less than .5 microns.

20. The prosthesis according to claim 1, wherein each of the first and second layers comprises polypropylene mesh.

21. The prosthesis according to claim 1, further comprising a peripheral edge, an outer area disposed inwardly of the peripheral edge, an inner area disposed inwardly of the outer area, wherein the at least one pocket formed between the first and second layers comprises at least one first pocket formed in the inner area and at least one second pocket formed in the outer area and separate from the at least one first pocket, the at least one second pocket including an access opening for gaining access to an interior of the at least one second pocket.

22. An implantable prosthesis for a tissue or muscle defect, the implantable prosthesis comprising:

at least one layer of material, at least a portion of which permits the formation of adhesions with tissue or muscle, the at least one layer including a peripheral edge, an outer area disposed inwardly of the peripheral edge, and an inner area disposed inwardly of the outer area;

a pocket formed in the at least one layer;

a first reinforcing member coupled to the at least one layer and surrounding the outer area, the first reinforcing member being constructed and arranged to reinforce at least the outer area; and

a second reinforcing member inwardly spaced from the first reinforcing member, the second reinforcing member being coupled to the at least one layer.

23. The prosthesis according to claim 22, wherein the at least one layer comprises a first layer of material and a second layer of material attached to the first layer of material.

24. The prosthesis according to claim 23, wherein first layer of material includes a material that permits the formation of adhesions with tissue or muscle and wherein the second layer of material comprises a material that is resistant to the formation of adhesions with tissue, muscle or organs.

25. The prosthesis according to claim 23, wherein each of the first and second layers of material includes a material that permits the formation of adhesions with tissue or muscle.

26. The prosthesis according to claim 25, further comprising a layer of barrier material attached to first and second layers of material, wherein the layer of barrier material is resistant to the formation of adhesions with tissue, muscle or organs.

27. The prosthesis according to claim 22, wherein each of the first and second reinforcing members is formed in a ring-shaped configuration.

28. The prosthesis according to claim 27, wherein the first and second reinforcing members are generally concentric with each other.

29. The prosthesis according to claim 22, wherein the first reinforcing member is disposed adjacent the peripheral edge.

30. The prosthesis according to claim 23, wherein the prosthesis is constructed and arranged to be provisionally attached to the tissue or muscle.

31. The prosthesis according to claim 30, wherein the outer area of at least the first layer of material is constructed and arranged to be provisionally attached to the tissue or muscle.

32. The prosthesis according to claim 30, wherein the inner area of at least the first layer of material is constructed and arranged to be provisionally attached to the tissue or muscle.

5

33. The prosthesis according to claim 23, wherein the first and second reinforcing members are sandwiched between the first and second layers of material.

34. The prosthesis according to claim 23, wherein the first and second layers of material are stitched together to form a first channel and a second channel, the first reinforcing member being disposed within the first channel and the second reinforcing member being disposed in the second channel.

10

35. The prosthesis according to claim 23, wherein the at least one pocket is formed between the first and second layers of material.

15

36. The prosthesis according to claim 34, wherein the at least one pocket comprises at least one pocket formed within the inner area and at least one pocket formed within the outer area.

20

37. The prosthesis according to claim 36, wherein each pocket includes an access opening.

38. The prosthesis according to claim 23, wherein the second layer of material is constructed and arranged to support stress induced by patient movement.

25

39. The prosthesis according to claim 25, wherein each of the first and second layers of material includes a plurality of interstices that are constructed and arranged to allow tissue or muscle to grow into the first and second layers.

30

40. The prosthesis according to claim 22, wherein the peripheral edge is constructed and arranged to resist the formation of tissue or muscle adhesions thereto.

41. The prosthesis according to claim 23, wherein each of the first and second layers of material comprises polypropylene mesh.

42. The prosthesis according to claim 22, wherein at least a portion of the outer area is constructed and arranged to extend beyond the defect by at least approximately 3 cm.

43. The prosthesis according to claim 22, wherein the prosthesis includes a surface having an area greater than 50 square cm.

44. An implantable prosthesis for a tissue or muscle defect, the implantable prosthesis comprising:

at least one layer of material, at least a portion of which permits the formation of adhesions with tissue or muscle, the at least one layer including a peripheral edge, an outer area disposed inwardly of the peripheral edge and an inner area disposed inwardly of the outer area;

at least one first pocket formed in the inner area; and

at least one second pocket formed in the outer area and separate from the at least one first pocket, the at least one second pocket including at least one access opening for gaining access to an interior of the at least one second pocket.

45. The prosthesis according to claim 44, further comprising a partition closing an end of the first pocket and defining a boundary between the at least one first pocket and the at least one second pocket.

46. The prosthesis according to claim 45, wherein the partition is constructed and arranged to prevent access from the first pocket to the second pocket.

47. The prosthesis according to claim 44, wherein a boundary of the at least one second pocket extends substantially to the peripheral edge.

48. The prosthesis according to claim 44, wherein the at least one layer of material comprises a first layer of material and a second layer of material attached to the first layer of material.

49. The prosthesis according to claim 44, wherein the at least one access opening comprises a slit.

50. The prosthesis according to claim 49, wherein the slit is arcuately shaped.

51. The prosthesis according to claim 44, wherein the at least one access opening comprises a plurality of spaced openings.

52. The prosthesis according to claim 51, wherein the at least one layer of material comprises a first layer of material and a second layer of material attached to the first layer of material, and wherein the at least one second pocket is defined by attachment of the first and second layers.

53. The prosthesis according to claim 52, wherein the spaced openings are formed in the first layer of material.

54. The prosthesis according to claim 53, wherein a portion of the first layer of material between the plurality of openings forms a bridge to the inner area.

55. The prosthesis according to claim 54, wherein a portion of at least the first layer of material between the plurality of openings is reinforced.

56. The prosthesis according to claim 44, further comprising a layer of barrier material attached to the at least one layer of material, wherein the layer of barrier material is resistant to the formation of adhesions with tissue, muscle or organs.

5 57. The prosthesis according to claim 44, further comprising:
a first reinforcing member coupled to the at least one layer and substantially surrounding the outer area, the first reinforcing member being constructed and arranged to reinforce at least the outer area; and

10 a second reinforcing member inwardly spaced from the first reinforcing member, the second reinforcing member being coupled to the at least one layer.

58. The prosthesis according to claim 44, wherein the at least one layer of material comprises a first layer of material and a second layer of material attached to the first layer of material and wherein the second layer of material is constructed and arranged to support
15 stress induced by patient movement.

59. The prosthesis according to claim 44, wherein the at least one layer of material comprises a first layer of material and a second layer of material attached to the first layer of material and wherein the first layer of material is constructed and arranged to be provisionally
20 attached to the tissue or muscle.

60. The prosthesis according to claim 44, wherein the at least one second pocket is constructed and arranged to be provisionally attached to the tissue or muscle.

25 61. The prosthesis according to claim 44, wherein the at least one layer of material comprises a first layer of material and a second layer of material attached to the first layer of material and wherein each of the first and second layers of material includes a plurality of interstices that are constructed and arranged to allow tissue or muscle to grow into the first and second layers.

62. The prosthesis according to claim 44, wherein the peripheral edge is constructed and arranged to resist the formation of tissue, muscle or organs adhesions thereto.

63. The prosthesis according to claim 44, wherein the at least one layer of material comprises a first layer of material and a second layer of material attached to the first layer of material and wherein each of the first and second layers of material comprises polypropylene mesh.

64. The prosthesis according to claim 44, wherein at least a portion of the outer area is constructed and arranged to extend beyond the defect by at least approximately 3 cm.

65. The prosthesis according to claim 60, wherein the at least one first pocket is constructed and arranged to be provisionally attached to the tissue or muscle.

66. The prosthesis according to claim 44, wherein the at least one first pocket is constructed and arranged to receive at least four fingers of a person implanting the prosthesis.

67. The prosthesis according to claim 44, wherein the prosthesis includes a surface having an area greater than 50 square cm.

68. An implantable prosthesis for a tissue or muscle defect, the implantable prosthesis comprising:

at least one layer of material, at least a portion of which is susceptible to the formation of adhesions with tissue or muscle, the at least one layer of material comprising a first layer of mesh material and a second layer of mesh material attached to the first layer of mesh material, the at least one layer including a peripheral edge, an outer area disposed inwardly of the peripheral edge and an inner area disposed inwardly of the outer area;

at least one first pocket formed in the inner area and defined by attachment of the first and second layers of mesh material; and

at least one second pocket formed in the outer area and defined by attachment of the first and second layers of mesh material, the at least one second pocket being separate from

the at least one first pocket, each of the at least one first and second pockets including an access opening for gaining access to an interior of the respective at least one pocket;

a first reinforcing member coupled to the at least one layer and substantially surrounding the outer area, the first reinforcing member being constructed and arranged to reinforce at least the outer area; and

a second reinforcing member inwardly spaced from the first reinforcing member, the second reinforcing member being coupled to the at least one layer.

69. The prosthesis according to claim 68, further comprising a partition between the first and second pockets.

70. An implantable prosthesis for a tissue or muscle defect, the implantable prosthesis comprising:

at least one layer of material, at least a portion of which is susceptible to the formation of adhesions with tissue or muscle, the at least one layer of material comprising a first layer of mesh material and a second layer of mesh material attached to the first layer of mesh material, the at least one layer including a peripheral edge; an outer area disposed inwardly of the peripheral edge and an inner area disposed inwardly of the outer area;

a barrier layer that substantially inhibits the formation of adhesions with tissue, the barrier layer being attached to at least the second layer of mesh material;

at least one first pocket formed in the inner area and defined by attachment of the first and second layers of mesh material; and

at least one second pocket formed in the outer area and defined by attachment of the first and second layers of mesh material, the at least one second pocket being separate from the at least one first pocket, each of the at least one first and second pockets including an access opening for gaining access to an interior of the respective at least one pocket;

a first reinforcing member coupled to the at least one layer and substantially surrounding the outer area, the first reinforcing member being constructed and arranged to reinforce at least the outer area; and

a second reinforcing member inwardly spaced from the first reinforcing member, the second reinforcing member being coupled to the at least one layer.

71. The prosthesis according to claim 70, further comprising a partition between the first and second pockets.

5 72. An implantable prosthesis for a tissue or muscle defect, the implantable prosthesis comprising:

at least one layer of material, at least a portion of which is susceptible to the formation of adhesions with tissue or muscle, the at least one layer of material comprising a first layer of mesh material and a second layer of mesh material attached to the first layer of mesh material, the at least one layer including a peripheral edge, an outer area disposed inwardly of the peripheral edge and an inner area disposed inwardly of the outer area;

a barrier layer that substantially inhibits the formation of adhesions with tissue, the barrier layer being attached to at least the second layer of mesh material;

at least one pocket defined by attachment of the first and second layers of mesh material, the at least one pocket including an access opening for gaining access to an interior of the at least one pocket; and

a reinforcing member coupled to the at least one layer and substantially surrounding the outer area, the first reinforcing member being constructed and arranged to reinforce at least the outer area.

20 73. An implantable prosthesis for repairing a tissue defect, the implantable prosthesis comprising:

an ingrowth layer, at least a portion of which is susceptible to the formation of adhesions with tissue or muscle, the ingrowth layer comprising a first layer of mesh material, a second layer of mesh material attached to the first layer of mesh material, and at least one first pocket disposed therebetween, the ingrowth layer including an inner central area and an outer peripheral area surrounding the inner central area; the prosthesis further comprising at least one of:

a) a barrier layer that substantially inhibits the formation of adhesions with tissue, the barrier layer being attached to at least the second layer of mesh material;

b) first and second reinforcing members coupled to the ingrowth layer, the first reinforcing member surrounding the outer peripheral area and being constructed and arranged to reinforce at least the entire outer peripheral area, the second reinforcing member being inwardly spaced from the first reinforcing member; and

5 c) at least one second pocket formed in the outer peripheral area and separate from the at least one first pocket, each of the at least one first and second pockets including an access opening for gaining access to an interior of the respective at least one pocket.

74. The prosthesis according to claim 22, wherein the first reinforcing member is
10 disposed inwardly of the peripheral edge.

10040936 010702

15